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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 57

Complete If Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KS	1	US- 6114620A	09-2000	Zuppero et al.	
	2	US- 4753579	06-1988	Murphy	
	3	US- 5525041	06-1996	Deak	
	4	US- 5299422	04-1994	Nakagawa et al.	
	5	US- 5317876	05-1994	Nakagawa et al.	
	6	US- 4045359	08-1997	Fletcher et al.	
	7	US- 4407705	10-1983	Garscadden et al.	
	8	US- 5593509	01-1997	Zuppero et al.	
	9	US- 5641585	06-1997	Lessing et al.	
	10	US- 6114620	09-2000	Zuppero et al.	
	11	US- 6218608	04-1001	Zuppero et al.	
	12	US- 6222116	04-2001	Zuppero et al.	
	13	US- 6268560	07-2001	Zuppero et al.	
	14	US- 2001-0018923 A1	09-2001	Zuppero et al.	
	15	US- 6327859 B1	12-2001	Zuppero et al.	
	16	US- 6649823 B2	11-2003	Zuppero et al.	
	17	US- 6678305 B1	01-2004	Zuppero et al.	
	18	US- 6700056 B2	03-2004	Zuppero et al.	
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KS	20	US- 20030166307 A1	09-2003	Zuppero et al.	
	21	US- 20030000570 A1	01-2003	Zuppero et al.	
	23	US- 20020196825 A1	12-2002	Zuppero et al.	
	24	US- 6678305	01-2004	Zuppero et al.	
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	26	US- 4651324	03-1987	Prein et al.	
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	28	US- 4756000	07-1988	Macken, John A.	
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KS	1	5,651,838		Fraas et al.	07-29-1997	
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INFORMATION DISCLOSURE CITATION IN AN APPLICATION (Use several sheets if necessary)	Attorney Docket Number 22122878-0412	Application Number 09/631,463
	Applicants Anthony C. Zuppero et al.	
	Filing Date August 3, 2000	Group Art Unit 1725

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

KS	"Electron-hole pair creation by reactions at metal surfaces", downloaded from www.aps.org/meet/CENT99/BAPS/abs?S6980001.html American Physical Society Centennial Meeting Program, Atlanta, GA. 20-26 March 1999
KS	"Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium", Physical Review Letters, Volume 82, Number 2. 11 January 1999

EXAMINER: DATE CONSIDERED: 11/18/04

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 5 of 57

Complete If Known	
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Attorney Docket Number	22122878-4412

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KS	1	US- 4,634,641	01-06-1987	Nozik	
	2	US- 5,488,231	01-30-1996	Kwon et al.	
	3	US- 5,757,833	05-26-1998	Arakawa et al.	
	4	US- 5,917,195	06-29-1999	Brown	
	5	US- 6,067,309	05-23-2000	Onomura et al.	
	6	US- 6,114,620	09-05-2000	Zuppero et al.	
	7	US- 6,218,608	04-17-2001	Zuppero et al.	
KS	8	US- 6,222,116	04-24-2001	Zuppero et al.	
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Sheet 6 of 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

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KS	1	US-6084173	07/04/2000	DiMatteo	
		US-			
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Sheet 7 of 57

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OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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KS	2	HARRISON, P. et al., The Carrier Dynamics of Far-Infrared Intersubband Lasers and Tunable Emitters, Institute of Microwaves and Photonics, University of Leeds, U.K., pp. 1-64	
	3	WEBER, et al., to X2 Electron Transfer Times in Type-II GaAs/A1As Superlattices Due to Emission of Confined and Interface Phonons, Superlattices and Microstructures, Vol. 23, No. 2 (1998).	
	4	FANN, W.S. et al., Electron Thermalization in Gold, Physical Review B, Brief Reports, Vol. 46, No. 20, (1992)	
	5	Ultrafast Surface Dynamics Group, Time-Resolved Two-Photon Photoemission (TR-2PPE), http://www.ilp.physik.uni-essen.de/aeschlimann/2y_photo.htm	
	6	LEWIS et al., Vibrational Dynamics of Molecular Overlayers on Metal Surfaces, Dept. of Chemistry, University of Pennsylvania, http://lorax.chem.upenn.edu/molsurf/cucotalk/html.	
	7	RETTNER et al., Dynamics of the Chemisorption of 02 on Pt(111): Dissociation via Direct Population of a Molecularly Chemisorbed Precursor at High Incidence Kinetic Energy, The Journal of Chemical Physics, Vol. 94, Issue 2 (1991)	
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KS	13	ALTUKHOV et al., Towards Si1-xGex Quantum-Well Resonant-State Terahertz Laser, Applied Physics Letters, Vol. 79, No. 24 (2001)	
	14	SUN et al., Intersubband Lasing Lifetimes of SiGe/Si and GaAs/AlGaAs Multiple Quantum Well Structures, Applied Physics Letters, Vol. 66, No. 25 (1995)	
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	27	BRAKO et al., Interaction of CO Molecules Adsorbed on Metal Surfaces, Vacuum 61,89-93 (2001)	
	28	BURGI et al., Confinement of Surface State Electronis in Fabry-Perot Resonators, Physical Review Letters, Vol. 81, No. 24 (1998)	
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	30	CHANG, Y.M., Interaction of Electron and Hold Plasma with Coherent Longitudinal Optical Phonons in GaAs, Applied Physics Letter, Vol. 80, No. 14 (2002)	
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	32	CHANG et al., Coherent Phonon Spectroscopy of GaAs Surfaces Using Time-Resolved Second-Harmonic Generation, Chemical Physcis 251, 283-308 (2000)	
	33	CHANG et al. Observation of Local-Interfacial Optical Phonons at Buried Interfaces Using Time-Resolved Second Harmonic Generation, Physical Review B, Vol. 59, No. 19 (1999)	
KS	34	CHEN et al., Stimulate-Emission-Induced Enhancement of the Decay Rate of Longitudinal Optical Phonons in III-V Semiconductors; Applied Physics Letters, Vol. 80, No. 16 (2002)	

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Attorney Docket Number	22122878-4412

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Sheet 11 of 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

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First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
KS	134	HARRISON et al., The Carrier Dynamics of Far-Infared Intersubband Lasers and Tunable Emitters, www.ee.leeds.ac.uk/homes/ph/	
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Sheet 20 of 57

Complete If Known	
Application Number	09/631,463
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number - Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KS	1	US- 6,119,651	09-19-2000	Anderson	
	2	US- 6,114,620	09-055-2000	Zuppero et al.	
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	4	US- 5,293,857	03-15-1994	Meyer	
	5	US-2002/0017827	02-14-2002	Zuppero et al.	
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FOREIGN PATENT DOCUMENTS

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Sheet 22 of 57

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Attorney Docket Number	22122878-4412

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KS	1	US- 4,390,507	05-20-1986	CAPASSO, et al.	
	2	US- 4,686,550	08-11-1987	CAPASSO, et al.	
	3	US- 4,849,799	07-18-1989	CAPASSO, et al.	
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	5	US- 6,084,173	07-04-2000	DIMATTEO	
KS	6	US- 6,232,546	05-15-2001	DIMATTEO, et al.	
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Sheet 23 of 57

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Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

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	8	BONDZIE, V. A., et al.,; "Oxygen adsorption ... gold particles ... TiO2(110)"; J. Vac. Sci. Tech. A., (1999) 17, pp. 1717 and figure 3	
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Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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Sheet 24 of 57

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Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

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KS	16	DIEKHONER, L., et al.; "Parallel pathways in methanol... Pt(111)"; Surf. Sci. 409 (1998) pp 384–391	
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Sheet 25 of 57

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Art Unit	1725
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Attorney Docket Number	22122878-4412

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KS	52	MITSUI, T., et al.; "Coadsorption and interactions of O and H on Pd(111)"; Surf. Sci., Article 12767, (2002)	
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Sheet 29 of 57

Complete If Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

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KS	69	ROBERTSON, A. J. B.; "Catalysis of Gas Reactions by Metals"; Logos Press Limited; 1970; LC # 70-80936; pp. 1-5, 10, 41; Great Britain, Adlard & son Ltd	

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KS	87	WILKE, Steffen, et al.; "Theoretical investigation of water formation on Rh and Pt Surfaces"; J. Chem. Phys., 112, (2000) PP 9986 - 9995	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 37 1 of 1 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
KS	36	P. ARMOUR et al., "Hot-electron transmission through metal-metal interfaces: a study of Au/Fe/Au trilayers in GaAs substrates", Applied Surface Science 123/124 (1998), Pages 412-417.	
	37	C.D. BEZANT et al., "Intersubband relaxation lifetimes in p-GaAs/AlGaAs quantum wells below the LO-phonon energy measured in a free electron laser experiment", Vacuum Solutions Online, Semicond. Sci. Technol. 14 No. 8 (August 1999) L25-L28, PII: S0268-1242(99)03669-X.	
	38	L. BURGI et al., "Confinement of Surface State Electrons in Fabry-Perot Resonators", Physical Review Letters, Volume 81, Number 24, 14 December 1998, Pages 5370-5373.	
	39	I. CAMPILLO et al., "Inelastic lifetimes of hot electrons in real metals", Physical Review Letters, Volume 83, Number 11, September 13, 1999, Pages 2230-2233.	
	40	CHIANG, T.-C., "Photoemission studies of quantum well states in thin films", Surface Science Reports 39 (2000) pp 181-235	
KS	41	DE PAULA, A. et al, "Carrier capture processes in semiconductor superlattices due to emission of confined phonons", J. Appl. Phys. 77 (12), 1995 pp 6306-6312.	

Examiner Signature		Date Considered	11/8/04

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Attorney Docket Number	22122878-4412

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KS	A	US-4045359	08-1977	Fletcher et al.	
	B	US-4407705	10-1983	Garscadden et al.	
	C	US-5932885	08-1999	DeBellis et al.	
	D	US-6114620	09-2000	Zuppero et al.	
	E	US-6218608-B1	04-2001	Zuppero et al.	
	F	US-6222116-B1	04-2001	Zuppero et al.	
	G	US-6268560-B1	07-2001	Zuppero et al.	
	H	US-2001/0018923-A1	09-2001	Zuppero et al.	
	I	US-6327859-B1	12-2001	Zuppero et al.	
	J	US-2002/0017827-A1	02-2002	Zuppero et al.	
	K	US-2002/0121088-A1	09-2002	Zuppero et al.	
KS	L	US-2002/0196825-A1	12-2002	Zuppero et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
KS	8	"Electron-hole pair creation by reactions at metal surfaces", downloaded from www.aps.org/meet/CENT99/BAPS/abs/S6980001.html American Physical Society Centennial Meeting Program, Atalanta, GA, 20-26 March 1999	
KS	9	"Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium", Physical Review Letters, Volume 82, Number 2. 11 January 1999	
KS	10	"The Solarex Guide to Solar Electricity" Solarex Corporation, Inc. Frederich, MD, pp. 66-67, April 1979	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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Application Number	09/631,463
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KS	1	REE, J. et al., "Dynamics of Gas-Surface Interactions: Reaction of Atomic Oxygen with Chemisorbed Hydrogen on TUNGSTEN," Journal of Physical Chemistry, Vol. 101 (#25), pp. 4523 - 4534, June 19, 1997.	
	2	REE, J. et al., "Reaction of atomic oxygen with adsorbed carbon monoxide on a platinum surface," Journal of Chemical Physics, Vol. 104, Issue 2, pp. 742 - 757, January 8, 1996.	
	3	NOLAN, P.D. et al., "Molecularly chemisorbed intermediates to oxygen adsorption on Pt(111): A molecular beam and electron energy-loss spectroscopy study," Journal of Chemical Physics, Vol. 111, No. 8, pp. 3696 - 3704, August 22, 1999.	
	4	NOLAN, P. D. et al., "Translation Energy Selection of Molecular Precursors to Oxygen Adsorption on Pt (111)," Physical Review Letters, Vol. 81, No. 15, pp. 3179 - 3182, October 12, 1998.	
	5	MURPHY, M. J. et al., "Inverted vibrational distributions from N_2 recombination at Ru(001): Evidence for a metastable molecular chemisorption well," Journal of Chemical Physics, Vol. 110, No. 14, pp. 6954 - 6962, April 8, 1999.	
	6	KIM, M. S. et al., "Reaction of Gas-Phase Atomic Hydrogen with Chemisorbed Hydrogen Atoms on an Iron Surface," Bull. Korean Chem. Soc., Vol. 18, No. 9, pp. 985 - 994, May 22, 1997.	
KS	7	BONN, M. et al., "Phonon-Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)," Science, Vol. 285, pp. 1042 - 1045, August 13, 1999. www.sciencemag.org	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 41 of 57

Complete If Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
KS	8	NOLAN, P. D. et al., "Direct verification of a high-translational-energy molecular precursor to oxygen dissociation on Pd(111)," Surface Science Letters, Vol. 419, pp. L107 - L113, September 24, 1998.	
	9	DAVIS, J. E. et al., "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)," Journal of Chem. Phys., Vol. 107(3), pp. 943 - 952, July 15, 1997.	
	10	TRIPA, C. Emil et al., "Surface-aligned reaction of photo-generated oxygen atoms with carbon monoxide targets," Nature, Vol. 398, pp. 591 - 593, April 15, 1999, www.nature.com.	
	11	SHIN HK, "Vibrationally excited OD Radicals from the Reaction of Oxygen-Atoms with Chemisorbed Deuterium on TUNGSTEN," Journals of Physical Chemistry, Vol. 102(#13), pp. 2372 - 2380, March 26, 1998.	
	12	TRIPA, C. Emil et al., "Kinetics measurements of CO photo-oxidation on Pt(111)," Journal of Chemical Physics, Vol. 105, Issue 4, pp. 1691 - 1696, July 22, 1996.	
KS			

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 42 of 57

Complete If Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KS	1	3,694,770		Burwell et al.	09/26/1972	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
KS	2	DT	1,230,509		Bleekrode et al.	12/15/1966	Abstract	X

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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KS	3	TRIPA, C. E. et al., "Kinetics measurements of CO photo-oxidation on Pt(111)," J. Chem. Phys., Vol. 105, No. 4, 22 July 1996, pages 1691-1696, especially the disclosure beneath the paragraph header "C. Cross section determination methods" on page 1693.	
	4	NOLAN, P. D. et al., "Molecularly chemisorbed intermediates to oxygen adsorption on Pt(111): A molecular beam and electron energy-loss spectroscopy study," J. Chem. Phys., Vol. 111, No. 8, 22 August 1999, pages 3696-3707, especially figure 9 and the description of figure 9 set forth on page 3702,	
		2nd full paragraph et seq.	
KS	5	REE, J. et al., "Reaction of atomic oxygen with adsorbed carbon monoxide on a platinum surface," J. Chem. Phys., Vol. 104, No. 2, 08 January 1996, pages 742-757, particularly the abstract and page 753.	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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KS	1	DT	1,230,509		Bleekrode et al.	12-15-1966	Abstract	X

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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KS	1	DIESING, D. et al., "Aluminium oxide tunnel junctions: influence of preparation technique, sample geometry and oxide thickness," Thin Solid Films 342 (1999), pages 282-290, received 26 February 1998; accepted 11 September 1998.	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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KS	1	6,114,620		Zuppero et al.	09-05-2000	

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KS	2	WO	01/28677	A1	NeoKismet L.L.C.	04-26-2001		
KS	3	WO	00/72384	A1	NeoKismet L.L.C.	11-30-2000		
KS	4	NL	1,065,463		Philips Electronic Ltd.	04-12-1967		

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Sheet 47 of 57

Complete If Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
KS	5	G.H. TAKAOKA et al., "Preparation and catalytic activity of nano-scale Au islands supported on TiO2", Nuclear Instruments & Methods in Physics Research, Section - B: Beam Interactions with Materials and Atoms, North-Holland Publishing Company, Amsterdam, NL, Vol. 121, No.1, 1997, pages 503-506,	
KS		XP004057973, abstract.	
KS	6	P. AVOURIS et al., "Electron-Stimulated Catalysis Device", IBM Technical Disclosure Bulletin, Vol. 25, No. 12, May 1, 1983, pages 6378-6379, New York, US, XP002219954.	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 48 of 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KS	1	5,651,838		Fraas et al.	07-29-1997	
	2	5,932,885		DeBellis et al.	08-03-1999	
	3	4,753,579		Murphy	06-28-1988	
	4	5,525,041		Deak	06-11-1996	
	5	5,299,422		Nakagawa et al.	04-05-1994	
KS	6	5,317,876		Nakagawa et al.	06-07-1994	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
KS	7	DT	1,230,509		Bleekrode	12-15-1966	Abstract	X

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Complete If Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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KS	8	"Electron-hole pair creation by reactions at metal surfaces", downloaded from www.aps.org/meet/CENT99/BAPS/abs?S6980001.html American Physical Society Centennial Meeting Program, Atalanta, GA, 20-26 March 1999	
KS	9	"Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium", Physical Review Letters, Volume 82, Number 2. 11 January 1999	
KS	10	"The Solarex Guide to Solar Electricity" Solarex Corporation, Inc. Frederich, MD, pp. 66-67, April 1979	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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Sheet 50 of 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

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KS	1.	FRESE, et al., "Analysis of Current/Voltage Curves at n-Si/SiO_2/Pt Electrodes", J. Electrochem. Soc., December 1994, pp. 3375-3382, Vol. 141, No. 12, The Electrochemical Society, Inc.	
	2.	FRESE, et al., "Methanol Oxidation at p-Si/Pt Electrodes, Evidence for Hot Hole Reactivity", J. Phys. Chem., 1995, pp. 6074-6083, Vol. 99, American Chemical Society.	
	3.	GADZUK, "Multiple Electron Processes in Hot-Electron Femtochemistry at Surfaces", http://www.cstl.nist.gov/div837/837.03/highlite/gadzuk1999.htm.	
	4.	FRESE, et al., "Hot Electron Reduction at Etched n-Si/Pt Thin Film Electrodes", J. Electrochem. Soc., September 1994, pp.2402-2409, Vol. 103, The Electrochemical Society Inc.	
	5.	GAILLARD, et al., "Hot Electron Generation in Aqueous Solution at Oxide-Covered Tantalum Electrodes, Reduction of Methylpyridinium and Electrogenerated Chemiluminescence of $Ru(bpy)_3^{2+*}$", J. Phys. Chem., 1999, pp.667-674, Vol. 103, American Chemical Society.	
	6.	SUNG, et al., "Demonstration of Electrochemical Generation of Solution-Phase Hot Electrons at Oxide-Covered Tantalum Electrodes by Direct Electrogenerated Chemiluminescence", J. Phys. Chem., 1998, pp. 9797-9805, Vol. 102, American Chemical Society.	
KS	7.	ZHDANOV, et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science, 1999, pp. L599-L603, Vol. 432, Elsevier Science B.V.	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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Sheet 51 of 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number - Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KS	1	US- 6,232,546	05-15-2001	DiMatteo et al.	
	2	US- 6,396,191	05/28/2002	Hagelstein et al.	
	3	US- 5,057,162	10/15/1991	Nelson	
KS	4	US- 5,593,509	01/14/1997	Zuppero et al.	
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Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 52 of 57

Complete if Known	
Application Number	09/631,483
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
KS	5	ACHERMANN, M. et al., "Carrier dynamics around nano-scale Schottky contacts: a femtosecond near-field study", Applied Surface Science 7659 (2002) 1-4.	
	6	AESCHLIMANN, M. et al., "Competing nonradiative channels for hot electron induced surface photochemistry", Chemical Physics, April 15, 1996, pp. 127-141, Vol: 205, Issue: 1-2.	
	7	AESCHLIMANN, M. et al., "Ultrafast electron dynamics in metals", The Ultrafast Surface Science Group, http://www.ilp.physik.uni-essen.de/aeschlimann/2y_photo.htm	
	8	AUERBACH, D. et al., "Reagent Vibrational Excitation: A Key to Understanding Chemical Dynamics at Surfaces ?", abstract only.	
	9	BALANDIN, A. et al., "Significant decrease of the lattice thermal conductivity due to phonon confinement in a free-standing semiconductor quantum well", Physical Review B, July 15, 1998, Vol. 58, Issue 3, pp. 1545-1549.	
	10	BALANDIN, A. et al., "Effect of phonon confinement on the thermoelectric figure of merit of quantum wells", Journal of Applied Physics, December 1, 1998, Vol. 84, Issue 11, pp. 6149-6153	
	11	BONN, M. et al., "Phonon- Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)", Science, Vol. 285, Number 5430, Issue of 13 Aug 1999, pp. 1042 - 1045	
	12	CHANG, Y. et al., "Coherent phonon spectroscopy of GaAs surfaces using time-resolved second-harmonic generation", Chemical Physics, 251/1-3, pages 283-308, (2000)	
	13	CHEN,-C. et al., "Hot electron reduction at n-Si/Au thin film electrodes", Journal-of-the-Electrochemical-Society, Vol. 139, November 1992, pages 3243-3249.	
KS	14	CHOI, C.K. et al., "Ultrafast carrier dynamics in a highly excited GaN epilayer", Physical Review B, Vol. 63, 115315, 15 March 2001, 6 pages.	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 53 of 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

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KS	15	DEBERNARDI, A. et al., "Anharmonic Phonon Lifetimes in Semiconductors from Density-Functional Perturbation Theory", Physical Review Letters, VOL. 75, NUMBER 9, 28 AUGUST 1995, pp 1819 - 1822.	
	16	DELPATTI, N. et al., "Temperature-dependent electron-lattice thermalization in GaAs", Physical Review B, 15 FEBRUARY 1999-I, Vol. 59, Number 7, pp 4576 - 4579.	
	17	DENZLER, D.N., et al., "Surface femtochemistry: Ultrafast reaction dynamics driven by hot electron mediated reaction pathways", Femtochemistry and Femtobiology: Ultrafast Dynamics in Molecular Science. (World Scientific, 2002).	
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	19	DRISKILL-SMITH, A. A. G. et al., "The "nanotriode:" A nanoscale field-emission tube", Applied Physics Letters, November 1, 1999, Vol. 75, Issue 18, pp. 2845-2847.	
	20	FAN, C. Y. et al., "The oxidation of CO on RuO2 - 110 - at room temperature", Journal of Chemical Physics, Vol. 114, Number 22, 8 June 2001, P 10058.	
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	22	FUNK, S. et al., "Desorption of CO from Ru - 001 - induced by near-infrared femtosecond laser pulses", Journal of Chemical Physics, Vol. 112, Number 22, 8 June 2000, pages 9888 - 9897.	
	23	GADZUK, J. W., "Resonance-assisted hot electron femtochemistry at surfaces", Physical Review Letters, May 27, 1996, Vol. 76, Issue 22, pages 4234-4237.	
	24	GADZUK, J. W., "Multiple Electron Processes in Hot-Electron Femtochemistry at Surfaces", http://www.cstl.nist.gov/div837/837.03/highlite/gadzuk1999.htm	
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Examiner Signature		Date Considered	11/8/04

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Sheet 54 of 57

Complete if Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1726
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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KS	26	GAILLARD, F. et al., "Hot electron generation in aqueous solution at oxide-covered tantalum electrodes. Reduction of methylpyridinium and electrogenerated chemiluminescence of Ru(bpy)32+", Journal of Physical Chemistry B, Vol. 103, No. 4, January 28, 1999, pages 667-74	
	27	GAO, S., "Quantum kinetic theory of vibrational heating and bond breaking by hot electrons", Physical Review B, Vol. 55, No. 3, 15 January 1997-I, pages 1876-1886.	
	28	GERGEN, B. et al., "Chemically Induced Electronic Excitations at Metal Surfaces", Science, Vol. 294, Number 5551, Issue of 21 December 2001, pages 2521-2523.	
	29	GUO, J. et al., "The desorption yield dependence on wavelength of femtosecond laser from CO/Cu(111)", Annual Meeting of the American Physical Society, March 1999, Atlanta, GA;	
		Session BC18 - Surfaces (General), ORAL session, March 21; Room 258W, GWCC [BC18.06]	
	30	HESS, S. et al., "Hot Carrier Relaxation by Extreme Electron - LO Phonon Scattering in GaN", http://www.physics.ox.ac.uk/rtaylor/images/hot%20carrier%20poster.pdf	
	31	HOFER, U., "Self-Trapping of Electrons at Surfaces", Science, Vol. 279, Number 5348, Issue of 9 January 1998, pages 190 - 191.	
	32	KATZ, G. et al., "A theoretical study of hole induced desorption", Journal of Chemical Physics, October 22, 1999, Vol. 111, Issue 16, pages 7593-7598.	
	33	LEE, B. C. et al., "Transmission of longitudinal optical phonons through a barrier in uniaxial crystals", Physical Review B, Vol. 65, 153315, 15 April 2002.	
	34	NANOLITE, "NANOLITE Sparkflashlamp", http://www.hsps.com/products/nanolaen.htm	
KS	35	NIENHAUS, H., "Electronic excitations by chemical reactions on metal surfaces", Surface Science Reports, 45, (2002), pages 1 - 78.	

Examiner Signature		Date Considered	1/8/07

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 55 of 57

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Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

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KS	36	PLIHAL, M. et al., "Role of intra-adsorbate Coulomb correlations in energy transfer at metal surfaces", Physical Review B, July 15, 1998, Vol. 58, Issue 4, pages 2191-2206.	
	37	PONTIUS, N. et al., "Size-dependent hot-electron dynamics in small Pd-clusters", Journal of Chemical Physics, December 8, 2001, Vol. 115, Issue 22, pages 10479-10483.	
	38	PRYBYLA, J. A. et al., "Femtosecond time-resolved surface reaction: Desorption of CO from Cu(111) in < 325 fsec", Physical Review Letters, January 27, 1992, Vol. 68, Issue 4, pp. 503-506.	
	39	RINNEMO, M., "Catalytic Ignition and Kinetic Phase Transitions", http://www2.lib.chalmers.se/cth/diss/doc/9596/RinnemoMats.html	
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	42	WHITE, J. M., "Using photons and electrons to drive surface chemical reactions", Journal of Molecular Catalysis A: Chemical 131, 1998, pages 71-90.	
	43	ZHDANOV, V.P. et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science, Vol. 432 (#3), pages L599-L603, Jul 20, 1999.	
KS	44	ZHU, X.-Y., "Surface photochemistry: from hot reactions to hot materials", Surface Science, Vol. 390, (1997), pages 224-236.	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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Attorney Docket Number	22122878-4412

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
KS	1	FRESE, K.W. Jr. et al., "Methanol Oxidation at p-Si/Pt Electrodes. Evidence for Hot Hole Reactivity", J. Phys. Chem., January 24, 1995, pages 6074-6083, Vol. 99, No. 16.	
KS	2	FRESE, K.W., Jr. et al., "Analysis of Current/Voltage Curves at n-Si/SiO2/Pt Electrodes", J. Electrochem. Soc., December 1994, pages 3375-3382, Vol., 141, No. 12.	

Examiner Signature	Kiley Stoner	Date Considered	11/8/04

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Sheet 57 of 57

Complete If Known	
Application Number	09/631,463
Filing Date	August 3, 2000
First Named Inventor	Anthony C. Zuppero
Art Unit	1725
Examiner Name	Kiley Stoner
Attorney Docket Number	22122878-4412

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number: Number - Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
KS	1	US- 6,114,620	09-05-2000	Zuppero et al.	
KS	2	US- 2002/0121088 A1	09-05-2002	Zuppero et al.	
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FOREIGN PATENT DOCUMENTS

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KS	3	WO 01/29938 A1		NeoKismet L.L.C.		
KS	4	WO 01/28677 A1		NeoKismet L.L.C.		

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